AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1-15 (Cancelled).

16. (Currently Amended) An external-cavity tunable laser system configured to emit radiation at a laser emission wavelength, comprising an external cavity ~~having~~ configured to propagate a plurality of cavity modes, said external cavity comprising:

a gain medium to emit an optical beam into the external cavity; and

a tunable optical resonant grating filter reflecting the optical beam at a resonant wavelength, said filter comprising:

a diffraction grating;

a planar waveguide optically interacting with said diffraction grating, the diffraction grating and the planar waveguide forming a resonant structure; and

a light transmissive material having a selectively variable refractive index to permit wavelength tuning of the filter, said light transmissive material comprising a liquid crystal material ~~so as to~~ configured to form a tunable cladding layer to change a resonant wavelength of [[for]] the planar waveguide,

wherein the planar waveguide is placed between the diffraction grating and the tunable cladding layer.

17. (Previously Presented) The laser system of claim 16, wherein the emitted radiation is on a single longitudinal mode.

18. (Previously Presented) The laser system of claim 16, further comprising a channel-allocation grid element arranged in the external cavity to define a plurality of pass bands substantially aligned with corresponding channels of a selected wavelength grid.

19. (Previously Presented) The laser system of claim 18, wherein the tunable resonant grating filter is arranged in the external cavity to tunably select one of the pass bands so as to select a channel to which to tune the optical beam.

20. (Previously Presented) The laser system of claim 18, wherein the selected wavelength grid has a channel spacing of 50 GHz or 25 GHz.

21. (Previously Presented) The laser system of claim 16, wherein the tunable resonant grating filter is arranged in the external cavity so that the optical beam impinges on the filter substantially perpendicular to a main surface of the planar waveguide.

22. (Withdrawn) An optical resonant grating filter reflecting optical radiation at a resonant wavelength, comprising:

a diffraction grating having a periodic structure comprising low-index regions and high-index regions, said diffraction grating having a coupling efficiency not larger than 0.0026;

a planar waveguide optically interacting with said diffraction grating, the diffraction grating and the planar waveguide forming a resonant structure; and

a light transmissive material having a selectively variable refractive index to permit tuning of the filter, said light transmissive material forming a tunable cladding layer for the planar waveguide,

wherein the planar waveguide is placed between the diffraction grating and the tunable cladding layer.

23. (Withdrawn) The filter of claim 22, wherein the light transmissive material is a liquid crystal material whose selectively variable refractive index is controlled by an electric signal.

24. (Withdrawn) The filter of claim 22, wherein the coupling efficiency of the diffraction grating is from 0.001 to 0.002.

25. (Withdrawn) The filter of claim 22, wherein the planar waveguide is a layer having a refractive index larger than the variable refractive index of the tunable cladding layer and of the average refractive index of the diffraction grating.

26. (Withdrawn) The filter of claim 25, further comprising a buffer layer placed opposite to the diffraction grating with respect to the planar waveguide, said buffer layer having a refractive index lower than the average refractive index of the diffraction grating.

27. (Withdrawn) The filter according to claim 22, further comprising a gap layer placed between the planar waveguide and the diffraction grating, said gap layer having a refractive index lower than that of the waveguide and than the average index of the diffraction grating.

28. (Withdrawn) The filter of claim 26, wherein the planar waveguide is made of silicon nitride material, the high-index regions of silicon nitride or silicon oxynitride, and the low-index regions and the buffer layer being made of silicon dioxide.

29. (Withdrawn) The filter of claim 27, wherein the gap layer is made of silicon dioxide.

30. (Withdrawn) The filter of claim 23, further comprising two light transparent electrically conducting layers arranged on opposite sides of the light transmissive material for applying the electric signal across the light transmissive material.

31. (Previously Presented) The laser system of claim 16, wherein the selectively variable refractive index of the liquid crystal material is controlled by an electric signal.

32. (Previously Presented) The laser system of claim 31, further comprising two light transparent electrically conducting layers arranged on opposite sides of the

light transmissive material for applying the electric signal across the light transmissive material.

33. (Previously Presented) The laser system of claim 16, wherein the tunable optical resonant grating filter exhibits a tunability within a tuning range of at least 10 nm.

34. (Currently Amended) An external-cavity tunable laser system configured to emit radiation at a laser emission wavelength, comprising an external cavity ~~having~~ configured to propagate a plurality of cavity modes, said external cavity comprising:

a gain medium to emit an optical beam into the external cavity; and

a tunable optical resonant grating filter reflecting the optical beam at a resonant wavelength, said filter comprising:

a diffraction grating;

a planar waveguide optically interacting with said diffraction grating, the diffraction grating and the planar waveguide forming a resonant structure; and

a light transmissive material having a selectively variable refractive index to permit wavelength tuning of the filter, said light transmissive material comprising a thermo-optical material having a thermo-optic coefficient dn/dT of not less than 10^{-4}/°C ~~so as to~~ configured to form a tunable cladding layer to change a resonant wavelength of [[for]] the planar waveguide,

wherein the planar waveguide is placed between the diffraction grating and the tunable cladding layer.

35. (Previously Presented) The laser system of claim 34, wherein the thermo-optical material is a polymer.